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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FICK, ANTHONY D

ART UNIT

PAPER NUMBER

1753

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/633,212	Applicant(s) CUDZINOVIC ET AL.	
	Examiner Anthony Fick	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bucker (U.S. 4,387,116).

Bucker discloses a method of forming layers on a solar cell surface.

Regarding claims 1 and 2, figure 1 shows a solar cell with layers on top. Bucker discloses forming an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then etching the first layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 3, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 4, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Regarding claims 9 and 10, Bucker further discloses forming an oxide layer over the silicon solar cell (column 2, paragraph 1), the oxide layer, layer 14 in figure 1. Bucker further discloses screen-printing an ink pattern, 16, on the oxide layer, 14, the

ink being a silk-screened, asphalt-based, ink mask, and then etching the oxide layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 11, Bucker discloses heating the oxide layer, thus the oxide is thermally grown (column 2, paragraph 1).

Regarding claims 14 and 15, figure 1 shows a solar cell with layers on top. Bucker discloses printing an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then etching the first layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 16, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 18, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Regarding claims 21 and 22, figure 1 shows a solar cell with layers on top. Bucker discloses forming an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then performing a processing step, etching the first layer, using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 23, Bucker further discloses after etching, depositing a layer of nickel using the ink as a mask (column 2, paragraph 4).

Regarding claim 24, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 25, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5, 7, 8, 12, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bucker as applied to claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 above, and further in view of Matsushita et al. (U.S.P.G.Pub 2002/0000242).

The disclosure of Bucker is as stated above for claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25.

The differences between Bucker and the claims include etching of material after removing the ink pattern and the etching exposing a silicon material.

Matsushita teaches a method to manufacture a thin film solar cell module. The method provides a mask pattern on top of a silicon oxide film, etches the silicon oxide

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film using the mask, removing the mask and then wet etching the silicon layer underneath (paragraph 0129).

Regarding claim 5, it would have been obvious to one having ordinary skill in the art at the time the invention was made to etch down to the silicon material as in Matsushita in the method of Bucker because this allows contacts to be formed with the silicon layer.

Regarding claims 7, 8, 12, 17 and 19, it would have been further obvious to one having ordinary skill in the art at the time the invention was made to etch the silicon oxide layer, then remove the mask and further etch the silicon material as in Matsushita within the method of Bucker because this allows monolithic thin film single crystal silicon solar cells to be separated from each other on a transparent substrate (Matsushita paragraph 0141). Because Matsushita and Bucker are both concerned with fabricating solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

5. Claims 6, 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bucker as applied to claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 above, and further in view of Dill et al. (U.S. 4,838,952).

The disclosure of Bucker is as stated above for claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25.

The difference between Bucker and the claims is the requirement that the solar cell is a backside-contact solar cell.

Dill teaches a backside-contact solar cell as shown in figure 3. Dill further teaches creating the electrical contacts by etching an oxide layer using a mask (column 4, paragraph 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to etch a backside-contact solar cell as in Dill in the method of Bucker because backside-contact solar cells can have a smooth front surface and therefore a non-scattering solar cell results (Dill abstract). Because Dill and Bucker are both concerned with methods of making solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

Response to Arguments

6. Applicant's arguments filed May 15, 2007 have been fully considered but they are not persuasive. Applicant argues with respect to the Bucker reference, that the claims are patentable over the reference as the reference does not disclose that the masking layer is free of silicon dioxide or would not scratch the material. The examiner respectfully disagrees. The Bucker reference does not disclose any silicon dioxide within the asphalt based ink and it is therefore reasonable to conclude that the ink does not contain any silicon dioxide. Absent any contrary showing, it is still the examiner's position that the ink does not contain silicon dioxide particles. The examiner suggests that applicant provide documentation that the ink of Bucker contains silicon dioxide in a large enough amount to show that the ink is not "substantially devoid of silicon dioxide". Applicant further argues that the combination of Bucker and Dill changes the principle operation of Bucker and disregards the gist of its disclosure as well as not having a

reasonable expectation of success. The examiner respectfully disagrees. The reference to Dill was utilized to show the knowledge of backside-contacts within the solar cell art. Also the transparent window of Bucker would not prevent formation of the holes as in Dill because the holes would be drilled through the backside of the solar cell (through 8 in Bucker to contact the tin oxide layer 12). This process is utilized in a variety of solar cells within the art and would have an expectation of success. Therefore the rejections are maintained.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick
AU 1753
August 2, 2007

ADF


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